

## 2.2.5 Air Quality

Under the Clean Air Act, the EPA is required to establish ambient air quality standards to protect human health and the environment. National Ambient Air Quality Standards (NAAQS) have been established for six pollutants including: nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter, and lead (see Table 2-14). The primary standards have been set to protect the public health of "sensitive" populations such as asthmatics, children, and the elderly. The secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

**Table 2-14 – National Ambient Air Quality Standards**

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon monoxide	9 ppm (10 mg/m <sup>3</sup> )	8-hour <sup>1</sup>	None	
	35 ppm (40 mg/m <sup>3</sup> )	1-hour <sup>1</sup>		
Lead	1.5 µg/m <sup>3</sup>	Quarterly average	Same as primary	
Nitrogen dioxide	0.053ppm (100 µg /m <sup>3</sup> )	Annual (arithmetic mean)	Same as primary	
Particulate matter (PM <sub>10</sub> )	150 µg /m <sup>3</sup>	24-hour <sup>2</sup>	Same as primary	
Particulate matter (PM <sub>2.5</sub> )	15.0 µg /m <sup>3</sup>	Annual <sup>3</sup> (arithmetic mean)	Same as primary	
	35 µg /m <sup>3</sup>	24-hour <sup>4</sup>	Same as primary	
Ozone	0.075 ppm (2008 standard)	8-hour <sup>5</sup>	Same as primary	
	0.08 ppm (1997 standard)	8-hour <sup>6</sup>	Same as primary	
	0.12 ppm	1-hour <sup>7</sup> (applies only in limited areas)	Same as primary	
Sulfur dioxide	0.03 ppm	Annual (arithmetic mean)	0.5 ppm (1,300 ug/m <sup>3</sup> )	3-hour <sup>1</sup>
	0.14 ppm	24-hour <sup>1</sup>		

SOURCE: U.S. Environmental Protection Agency 2008.

NOTES: µg/m<sup>3</sup> micrograms per cubic meter  
mg/m<sup>3</sup> milligrams per cubic meter  
PM<sub>2.5</sub> particulate matter equal to or less than 2.5 microns in diameter  
PM<sub>10</sub> particulate matter equal to or less than 10 microns in diameter  
ppm parts per million

<sup>1</sup> Not to be exceeded more than once per year.

<sup>2</sup> Not to be exceeded more than once per year on average over three years.

<sup>3</sup> To attain this standard, the three-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

<sup>4</sup> To attain this standard, the three-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m<sup>3</sup> (effective December 17, 2006).

<sup>5</sup> To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

<sup>6</sup> (a) To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as U.S. Environmental Protection Agency undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

<sup>7</sup> (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(b) As of June 15, 2005 the U.S. Environmental Protection Agency revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact Areas.

Geographic areas, which may not coincide with political boundaries, are designated as attainment, nonattainment, or unclassified for each of the NAAQS. When a community is unable to comply with one or more of the NAAQS, they are categorized as a “nonattainment area” for those specific pollutants. For counties included in this study area, the ADEQ works with community officials to develop a set of actions that when fully implemented will bring the area into compliance. These actions, along with a narrative description of the issues, technical documentation, and agreements among stakeholders, are included in a plan called a State Implementation Plan (SIP). The SIP is submitted by ADEQ to EPA for approval. When an area can demonstrate compliance with the standards through sufficient monitoring, ADEQ submits a maintenance plan to the EPA and requests that the EPA redesignate the area to attainment status.

An unclassified designation indicates that the status of attainment has not been verified through data collection. When permitting a new source, an unclassified area is treated as an attainment area. Ultimately the status of an area is designated separately for each criteria pollutant, which means that one geographic area may have the designation of unclassified, attainment, and nonattainment status. Figure 2-16 shows the nonattainment area boundaries by focus area.

### Nonattainment Areas Within the Eastern Arizona Framework Study Area

Table 2-15 shows an overview of all the nonattainment areas within the study area. Following the table are details about each nonattainment status by focus area.

**Table 2-15 – Air Quality Nonattainment and Maintenance Areas  
within the Study Area**

Location/Status	Pollutant	Pollutant Sources	SIP Date
<b><i>Mogollon Rim</i></b>			
Payson Maintenance Area	PM <sub>10</sub>	Rock crushers, concrete batch plants, sawmill, wood smoke, paved & unpaved roads.	June 1995
<b><i>Copper Country</i></b>			
Morenci Maintenance Area	SO <sub>2</sub>	Historical copper smelter and fugitive emissions.	June 2002
<b><i>Cochise-Santa Cruz</i></b>			
Paul Spur Non-Attainment Area	PM <sub>10</sub>	Lime plant, unpaved road, border dragging operations, periodic natural events.	July 1990
Douglas Non-Attainment Area	PM <sub>10</sub>	Paved & unpaved roads, agricultural burning & dust, cleared areas, off-road vehicles, unpaved parking lots, emissions originating in Mexico.	June 1993
	SO <sub>2</sub>	Historical copper smelter and fugitive emissions.	Dec. 2001
Nogales Non-Attainment	PM <sub>10</sub>	Paved & unpaved roads, cleared areas, emissions originating in Mexico.	June 1993

### Mogollon Rim Focus Area

The Payson area in Gila County is designated as an attainment area with a maintenance plan for particulate matter equal to or less than 10 microns in diameter (PM<sub>10</sub>). Particulate matter sources identified include industrial sources (such as rock crushers, concrete batch

plants, and a sawmill), smoke from the combustion of wood, and both paved and unpaved roads. The area was designated as a moderate PM<sub>10</sub> nonattainment area in 1993. Based upon monitoring data from 1998 through 2000, which demonstrated compliance with the PM<sub>10</sub> standards, and an SIP submitted by ADEQ, EPA concluded the Payson area was in compliance. ADEQ submitted a maintenance plan and a request for redesignation that was approved and granted by EPA in 2002.

This focus area has no designated nonattainment areas for any of the six criteria pollutants at this time.

### **Copper Country Focus Area**

The Morenci area in Greenlee County is designated as a SO<sub>2</sub> attainment area with a maintenance plan. Historically, the Phelps Dodge Morenci, Inc. copper smelter was the source of SO<sub>2</sub> that previously caused noncompliance with the SO<sub>2</sub> standard. The smelter was dismantled in 1995. The *Morenci Sulfur Dioxide Nonattainment Area State Implementation and Maintenance Plan* and request for redesignation to attainment was submitted to EPA by ADEQ in 2002. Redesignation was granted in 2004.

The Morenci Mine, owned by Freeport-McMoRan Copper and Gold, is the largest copper mine in North America and rates as one of the largest in the world. The property is approximately 60,000 acres in size and includes five mining pits, three of which are currently active (Infomine.com, 4/1/08). A commercial-scale copper-concentrate leaching process, direct electrowinning, and copper-concentrating operation were brought online in 2007.

The Copper Country Focus Area has no designated nonattainment areas for any of the six criteria pollutants at this time.

### **Cochise-Santa Cruz Focus Area**

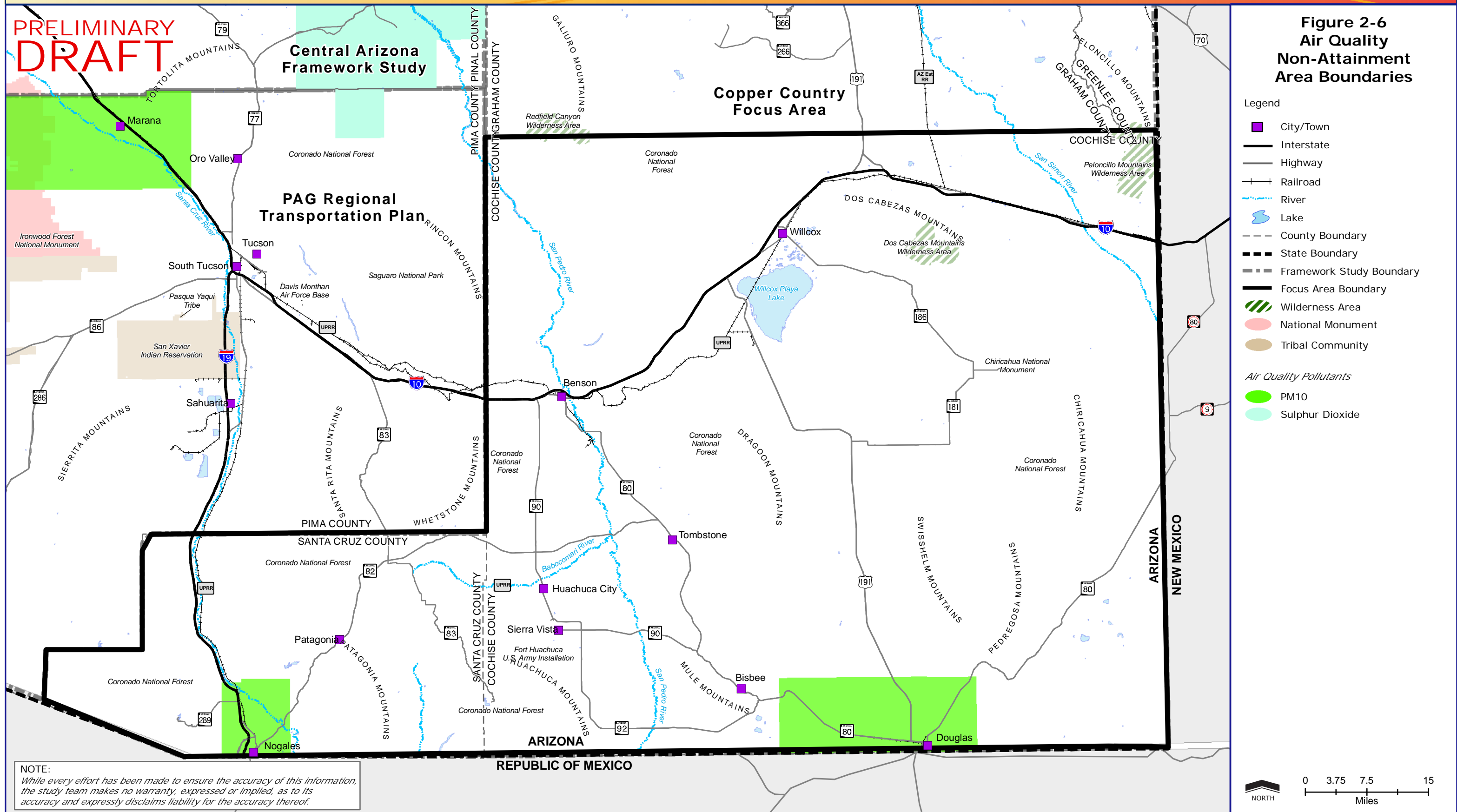
The Paul Spur Area in Cochise County is designated as a nonattainment area for PM<sub>10</sub>. Sources of particulate matter include stack and fugitive emissions from a lime plant (operated by Chemical Lime Company), unpaved roads, and dragging operations on the U.S./Mexico border. ADEQ submitted an SIP to the EPA in 1990; the SIP primarily focused on implementing control measures to reduce particulate matter emissions from the lime plant. There has only been one exceedance of the PM<sub>10</sub> standard, occurring in 2003, since the SIP was submitted. This exceedance was measured during a high-wind event. ADEQ determined that the event met the criteria included in their "exceptional and natural events policy" and is considering whether to include a Natural Events Action Plan (NEAP) in a maintenance plan for the Paul Spur Area, and request that EPA redesignate the area as attainment with a maintenance plan.

The Douglas area in Cochise County is a nonattainment area for PM<sub>10</sub> and SO<sub>2</sub>. Sources of PM<sub>10</sub> include dust from both paved and unpaved roads, unpaved parking lots, agricultural waste burning, wind-generated dust from agricultural and cleared lands, off-road vehicle use, and emissions originating in Mexico. ADEQ submitted a PM<sub>10</sub> SIP to the EPA in 1993. The last violation was recorded in 1989 and the last 24-hour exceedance occurred in 1991.

The Douglas copper smelter stack, along with fugitive emissions from related operations, was identified as the source of SO<sub>2</sub> causing nonattainment with the SO<sub>2</sub> standard. The smelter was dismantled in 1995. ADEQ submitted a maintenance plan and requested redesignation in 2001. No decision on the request is listed on the ADEQ website.



# Regional Framework Study: Eastern Arizona, Cochise-Santa Cruz Focus Area



The Nogales area in Santa Cruz County is listed as a PM<sub>10</sub> nonattainment area. Emissions sources cited include paved and unpaved roads, cleared areas, and emissions generated in neighboring Mexico. An SIP was submitted by ADEQ to the EPA in 1993. The SIP asserts that the Nogales area can demonstrate attainment except “for emissions emanating from outside the United States.” Although the EPA has indicated that the SIP is complete, it has not acted on the plan.

### Sources Within the Study Area Operating Under a Title V Air Quality Permit

Many large sources of air pollution are required to obtain a Title V air quality permit from the applicable state or local permitting agency in Arizona. The ADEQ has jurisdiction over the Title V program for the counties included in this study. Title V operating permits are required by the Clean Air Act, as amended in 1990, for sources included within specified source categories and for noncategorical sources that emit air pollutants in quantities that meet major source thresholds. The sections below provide information on current or pending Title V permit holders in each focus area.

#### Mogollon Rim Focus Area

- **Snowflake Pulp Mill:** Catalyst Paper Corporation has the capacity to produce 375,000 metric tons of recycled newsprint annually. The boiler stack would be the primary source of air pollutant emissions. The primary pollutants in the stack emissions are CO, NO<sub>x</sub>, and SO<sub>2</sub> which result from the combustion of the wood. Other pollutants present in the emissions are particulate matter, volatile organic compounds, and hazardous air pollutants. The power plant is expected to begin operation in the first part of 2008.
- **Snowflake White Mountain Power Plant:** This recently constructed 24-megawatt power plant, operated by Renegy Holdings, Inc., is fueled by biomass. The bubbling-fluidized bed boiler is fed with paper sludge from the Catalyst Paper Corporation's Snowflake Paper Mill and wood waste material from local sources. At the end of April 2008, the plant was successfully synchronized to the electric utility grid. The plant is scheduled to be fully operational by the end of June 2008. Power generated at this facility will be purchased by Arizona Public Service and Salt River Project (Renegy Holdings, Inc. 2008).
- **Coronado Generating Plant:** This Salt River Project plant is a coal-fired steam-generating station that has a capacity of 773 megawatts.
- **Springerville Generating Station:** The capacity of Springerville Station was recently upgraded to 1,560 megawatts when two additional units were added. All four units are coal-fired and are operated by the Tucson Electric Power Company.
- **Blue Hills Regional Landfill:** This Apache County municipal solid waste landfill transports, deposits, and manages waste-lined cells. Decomposition of waste materials from the landfill results in emission of methane and carbon dioxide. Particulate matter is emitted during the application of soil cover, from stockpiling of soil and cover materials, and when equipment is driven over unpaved surfaces.
- **Apache Nitrogen Products Plant:** Apache Nitrogen Products operates this source, manufactures ammonium nitrate, ammonium sulfate, inorganic chemicals, and fertilizers. Both ammonia and ammonium nitrate are emitted from product storage tanks. Combustion byproducts are emitted from the process steam boilers, generators and compressor engines. Volatile organic compounds and hazardous air pollutants are emitted from fuel storage tanks.



### Copper Country Focus Area

- **Morenci Mine – Freeport McMoRan Copper and Gold:** The mine property comprises approximately 60,000 acres and includes five pits, three of which are currently in operation. This copper mine is one of the largest open pit copper mines in the world, producing an estimated 840 million pounds of copper per year. ([www.infomine.com/minesite/minesite.asp?site=morenci](http://www.infomine.com/minesite/minesite.asp?site=morenci))

### Cochise-Santa Cruz Focus Area

- **Hot Springs – All American Pipeline:** This facility includes one of many pump stations that are used to transfer crude oil to the All American Pipeline. Emission sources include three natural gas-fired turbines and two natural gas-fired heaters. The facility is classified as a “major source” because emissions of nitrogen oxides from the operation have the potential to exceed 100 tons per year.
- **Fairview Generating Station – Arizona Public Service:** APS utilizes this generating station to supply power to the grid on an as-needed basis. The combustion turbine can be fueled by No. 2 Fuel Oil or natural gas.
- **Bowie Power Station – Bowie Power Station, LLC:** This natural gas-fired power plant has a planned capacity of 1000 megawatts. Construction of the first phase, 500 megawatts, is anticipated to begin in 2008.
- **Chemical Lime Company in Douglas – Chemical Lime Company:** This facility manufactures lime from limestone. The limestone is removed from a quarry, crushed, and screened in preparation for lime manufacturing. The manufacturing process includes three kilns and a variety of handling equipment. In the kilns, calcium carbonate is heated to produce calcium oxide and carbon dioxide. Criteria pollutants with the potential to exceed major source thresholds include particulate matter, particulate matter less than 10 microns in size, sulfur dioxide, nitrogen oxides, and carbon monoxide.
- **Cochise County Regional Landfill – Cochise County:** This municipal solid waste landfill transports, deposits, and manages waste lined cells. Decomposition of waste materials from the landfill results in emission of methane and carbon dioxide. Particulate matter is emitted during the application of soil cover, from stockpiling of soil and cover materials, and when equipment is driven over unpaved surfaces. The landfill has been in operation since July of 2000.
- **San Simon Compressor Station – El Paso Natural Gas Company:** The San Simon Compressor Station provides natural gas compression for a large natural gas pipeline in the southwestern United States. The station includes three natural gas-fired regenerative turbine engines installed in 1953. No air pollution controls have been installed.
- **Willcox Compressor Station – El Paso Natural Gas Company:** This station operates two natural gas-fired combustion turbines to power the compression units. Emissions consist primarily of nitrogen oxides, sulfur dioxide, carbon monoxide, volatile organic compounds, and formaldehyde.
- **Benson Compressor Station – El Paso Natural Gas Company:** This station operates two natural gas-fired combustion turbines to power the compression units. Emissions consist primarily of nitrogen oxides, sulfur dioxide, carbon monoxide, volatile organic compounds, and formaldehyde.

- **Bowie Compressor Station – El Paso Natural Gas Company:** This station operates one natural gas-fired combustion turbine to power the compression units. Emissions consist primarily of nitrogen oxides, sulfur dioxide, carbon monoxide, volatile organic compounds, and formaldehyde. Emission control equipment is not included.
- **Apache Generating Station – Arizona Electric Power Cooperative, Inc.:** This coal-fired station has a generating capacity of 520 megawatts. Power is supplied to members of the cooperative in Arizona and California.
- **Valencia Power Plant – UNS Electric, Inc.:** This facility is primarily used for peaking power and voltage support in Santa Cruz County during hot weather months. The facility is permitted for four simple cycle combustion turbine generator units. The turbines are fueled by natural gas, distillate fuel or a combination of both.

### **Future Air Quality Impacts in the Eastern Arizona Regional Framework Study Area**

In the future, Arizona's population is projected to increase, and land development would occur throughout the state. This could result in increased emissions attributable to vehicle traffic and construction-related activities. Vehicle travel on both paved and unpaved roads re-entrains particulate emissions into the air, while tailpipe emissions from the combustion of gasoline and diesel fuels will emit NO<sub>x</sub>, CO, SO<sub>2</sub>, O<sub>3</sub>, and particulate matter. Construction activities will result in similar emissions from earthmoving activities and the operation of off-road construction equipment.